

SELF-ALIGNED GATED ROD FIELD EMISSION DEVICE AND  
ASSOCIATED METHOD OF FABRICATION

ABSTRACT OF THE DISCLOSURE

A self-aligned gated field emission device and an associated method of fabrication are described. The device includes a substrate and a porous layer disposed adjacent to the surface of the substrate, wherein the porous layer defines a plurality of substantially cylindrical channels, each of the plurality of substantially cylindrical channels aligned substantially parallel to one another and substantially perpendicular to the surface of the substrate. The device also includes a plurality of substantially rod-shaped structures disposed within at least a portion of the plurality of substantially cylindrical channels defined by the porous layer and adjacent to the surface of the substrate, wherein a portion of each of the plurality of substantially rod-shaped structures protrudes above the surface of the porous layer. The device further includes a gate dielectric layer disposed on the surface of the porous layer, wherein the gate dielectric layer is disposed between the plurality of substantially rod-shaped structures. The device still further includes a conductive layer selectively disposed on the surface of the gate dielectric layer, wherein the conductive layer is selectively disposed between the plurality of substantially rod-shaped structures.